

---

## ABSTRACT OF THE DISCLOSURE

A<sup>9</sup> Metal traces and solder bump pads are formed on a semiconductor substrate by way of a semiconductor template that has been micromachined to receive solder paste material. The solder paste material is then formed into precisely controlled ball shapes and metal trace geometries. First, a semiconductor substrate is covered with a mask material for protecting selected surfaces of the substrate that are not to be etched. Next, a mask is applied in order to etch the substrate surface below. Solder ball sites and metal trace channels are formed at this time. A solder nonwetable material is applied to the exposed surfaces of the solder ball sites and the metal trace channels. A solder paste can then be applied uniformly across the surface of the substrate, thus filling in any sites and channels, or both, that are used to form the balls or metal traces desired. The semiconductor template is then applied solder side to a second substrate so that the solder balls and traces can be applied directly on the second substrate using heat to reflow the solder to the second substrate.

---